

## Claims

1. A method of producing porous calcined granules of a non-combustible material, the method including:  
preparing agglomerates of said non-combustible material and a combustible material;  
calcining said agglomerates in a calcining furnace comprising a substantially enclosed chamber with an inlet at the top and outlet at the bottom and divided into a top section and a bottom section by a frame means, and the furnace further including a heating means for heating the agglomerates in the top section, a movement means for moving the agglomerates, and a cooling means for cooling the calcine product in the lower part of the furnace;  
the heating means able to ignite an initial batch of agglomerates in the top section and by control of the inflow of agglomerates and movement of agglomerates and the air flow, the calcining process is essentially self-sustaining without further use of the heating means.
2. A method of producing porous calcined granules according to claim 1 such that the step of preparing agglomerates includes at least partially drying the agglomerates in a rapid flow of hot air obtained as exhaust from the calcining furnace.
3. Porous calcine granules of a non-combustible material produced by the method of claim 1.
4. A method of producing porous calcined granules of a non combustible material, the method including forming agglomerates of said mixture, at least partially drying said agglomerates, and calcining the agglomerates in a furnace such that energy generated by combustion of the combustible material is at least partially utilised for said calcining.

5. A method according to claim 4 with said calcining being initiated by igniting the at least partially dried agglomerates.
- 5 6. A method according to claim 5 such that the calcining is sustained by the energy released by combustion of the combustible material.
7. A method according to claim 6 such that the combustible material is dried to a water content of less than 30 wt%.
- 10 8. A method according to claim 5 such that the combustible material or the incombustible material is comminuted prior to formation of the agglomerates.
9. A method according to claim 8 such that the agglomerates of combustible material and non-combustible material are formed as pellets or spheres.
- 15 10. A method according to claim 8 such that the combusted material is incorporated interstitially in the non-combustible material.
11. A method according to claim 7 such that the agglomerates are at least partially dried by subjecting the agglomerates to a rapid flow of hot air which at least partially includes exhaust heat from the calcining process.
- 20 12. A method according to claim 8 such that the combustible material or the incombustible material is comminuted in a working chamber with curved internal working surface and an input leading into the working chamber and an output leading out of the working chamber; a rotating arm mounted eccentrically within the working chamber forms a primary nip position at the closest point between the end of the rotating arm and the curved internal working surface such that the material to be comminuted is fed into the input and is comminuted at the nip position by shear forces caused by the
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comminuted material being forced to move by the rotating arm relative to material on the curved internal working surface.

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13. A comminutor for comminuting material to a required size comprising: a working chamber with curved internal working surface and an input leading into the working chamber and an output leading out of the working chamber; a rotating arm mounted eccentrically within the working chamber so as to form a primary nip position at the closest point between the end of the rotating arm and the curved internal working surface; wherein the material to be
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- comminuted is fed into the input and is comminuted at the nip position by shear forces caused by the comminuted material being forced to move by the rotating arm relative to material on the curved internal working surface.
14. A process for the production of porous granules, which includes the steps of:
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- (a) mixing at least one siliceous materials with another or with at least one cellulosic and/or carbonaceous material; and
- (b) subjecting the mixture to calcination.
15. A process for the production of porous granules which includes the steps of:
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- (a) mixing at least one siliceous materials with another or with at least one cellulosic and/or carbonaceous material, comminuting at least one of said material in a comminutor according to claim 13; and
- (b) subjecting the mixture to calcination.
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16. A calcining furnace comprising a substantially enclosed chamber with an inlet at the top and outlet at the bottom and divided into a top section and a bottom section by a frame means, and the furnace further including a heating means for heating the agglomerates in the top section, a movement means for moving
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- the agglomerates, and a cooling means for cooling the calcine product in the lower part of the furnace; the heating means able to ignite an initial batch of

agglomerates in the top section and by control of the inflow of agglomerates and movement of agglomerates and the air flow, the calcining process is essentially self-sustaining without further use of the heating means.

17. A process for the production of porous granules which includes the steps of:
- (a) mixing at least one siliceous materials with another or with at least one cellulosic and/or carbonaceous material; and
  - (b) subjecting the mixture to calcination in a calcining furnace according to claim 16.

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